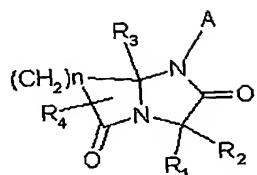


CLAIMS

1. Compounds of the general formula (I)

(I)



in which:

5 A is chosen among carbocyclic aromatic groups, heterocyclic aromatic groups, and arylC₁₋₄alkyl;

R₁ is chosen among:

- hydrogen,
- arylC₁₋₇alkyl, optionally substituted on the aryl moiety with one or more groups chosen among hydroxy, C₁₋₄alkoxy, halogen, haloC₁₋₄alkyl;
- 10 - heterocyclC₁₋₇alkyl, optionally substituted on the heterocycl moiety with one or more groups chosen among C₁₋₄alkyl and hydroxy;
- C₁₋₇ alkyl, optionally interrupted by an oxygen or sulphur atom or optionally substituted at any position by one or more groups chosen among hydroxy, thio, amino, carboxyl, aminocarbonyl, guanidinyl.

15 R₂ is chosen among hydrogen, C₁₋₄alkyl, arylC₁₋₄alkyl and phenyl; or else R₁ and R₂, taken together, form a saturated carbocyclic ring containing from 3 to 8 carbon atoms;

R₃ is chosen among hydrogen, C₁₋₄alkyl, arylC₁₋₄alkyl, CONH₂ and COOR₅ in which R₅ is chosen between hydrogen and C₁₋₄alkyl;

20 R₄ is chosen among hydrogen, C₁₋₄alkyl, aryl, arylC₁₋₄alkyl and heterocycl;

n is 2, 3 or 4;

in the form of a racemic mixture or in the form of enantiomers, and pharmaceutically acceptable salts or solvates thereof.

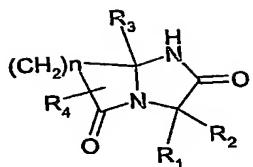
25 2. The compounds according to Claim 1, in which: A is phenyl, thiienyl, pyridyl, pyrimidinyl group, optionally substituted, benzyl or 4-methylbenzyl; R₁ is

hydrogen, C₁₋₄ alkyl, benzyl, -CH₂OH, -CH₂CH₂CONH₂, -CH₂COOH, indol(3-yl)methyl; R₂ is hydrogen, C₁₋₄ alkyl or benzyl; R₃ and R₄ are hydrogen or methyl, and n is 2.

3. The compounds according to Claim 2, in which: A is phenyl optionally substituted; R₁, R₂, R₃ and R₄ are hydrogen; and n is 2.
- 5 4. The compounds according to Claims 1-3, in which A is substituted with 1 to 3 substituents chosen among Me, Et, i-Pr, OH, COOEt, COOH, CH₂OH, SO₂NH₂, SO₂Me, OMe, Cl, F, CN and CF₃.
- 10 5. The compounds according to Claim 4, in which A is substituted with 1 to 3 substituents chosen among Me, Et, i-Pr, OH, CN, Cl and CF₃.
6. The compounds according to Claim 1 or 2, in which said C₁₋₄alkyl group is chosen among Me, Et, i-Pr, i-Bu and cyclopropylmethyl.
7. The compounds according to Claim 1, chosen in the group consisting of:
 - 1-Phenyl-tetrahydro-1H-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-o-tolyl-tetrahydro-1H-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(2,6-Dimethyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-Thiophen-2-yl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-m-Tolyl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-p-Tolyl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 20 1-(5-Fluoro-2-methyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(3-Fluoro-2-methyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(2-Trifluoromethyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(4-Chloro-2-methyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(3-Chloro-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 25 1-(3-Methoxy-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(3-Cyano-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(4-Chloro-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(3-Hydroxy-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(3-Trifluoromethyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 30 1-(4-Trifluoromethyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(4-Methoxy-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(3,5-Dimethyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
 - 1-(3,4-Dimethyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;

1-Naphthalen-2-yl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-(3-Isopropyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-(4-Chloro-3-methyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
3-Benzyl-1-phenyl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
5 3-Methyl-1-phenyl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
3-Isobutyl-1-phenyl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-(3-Fluoro-5-methyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-(3-Fluoro-4-methyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
7a-Methyl-1-phenyl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
10 (S)-1-o-Tolyl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
(R)-1-o-Tolyl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-(4-Ethyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-(4-Isopropyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-(4-Hydroxymethyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
15 4-(2,5-Dioxo-hexahydro-pyrrolo[1,2-a]imidazol-1-yl)-benzoic acid;
4-(2,5-Dioxo-hexahydro-pyrrolo[1,2-a]imidazol-1-yl)-benzoic acid ethyl ester;
1-(4-Methanesulfonyl-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-(4-Fluoro-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-(4-Cyano-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
20 1-Pyridin-2-yl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-Pyridin-3-yl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-(5-Methylpyridin-2-yl)-tetrahydropyrrolo[1,2-a]imidazole-2,5-dione;
1-(2-Cyano-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
1-(3-Fluoro-phenyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione;
25 1-Benzyl-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione.
1-(4-methylbenzyl)-tetrahydro-pyrrolo[1,2-a]imidazole-2,5-dione.

8. A process for the preparation of the compounds of formula (I) as described in
Claim 1, comprising the reaction of a compound of formula (II)



(II)

with a compound of formula (III)

A-X

(III)

5 in which A, R₁, R₂, R₃, R₄ and n are defined as in Claim 1, and X is a halogen atom, to obtain the desired compounds of formula (I).

9. The process according to Claim 8, in which in the compound of formula (III) X is chosen between bromine and iodine.

10. The process according to Claims 8-9, for the preparation of the compounds of formula (I) wherein A is a carbocyclic aromatic group or a heterocyclic aromatic group, optionally substituted, in which the compound of formula (II) is dissolved in an appropriate solvent together with the compound of formula (III) in the presence of a base and of a catalytic amount of a copper salt, at a temperature of between 60°C and 140°C.

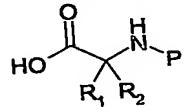
15. 11. The process according to Claim 10, in which said solvent is N-methylpyrrolidone, said base is potassium carbonate, said copper salt is copper iodide, and the reaction is conducted at a temperature of 120°C.

12. The process according to Claims 8-9, for the preparation of the compounds of formula (I) wherein A is arylC₁₋₄alkyl, in which the compound of formula (II) is dissolved in an appropriate solvent together with the compound of formula (III), in the presence of a suitable base at a temperature between 60°C and 140°C.

20. 13. The process according to claim 12, in which said solvent is chosen among acetonitrile, methylene chloride, acetone, said base is chosen among triethylamine, potassium carbonate, 2-*tert*-Butylimino-2-diethylamino-1,3-dimethylperhydro-1,3,2-diazaphosphorine, N,N-Diisopropylethylamine, at a temperature of 100°C.

25. 14. The process for the preparation of compounds of formula (I) as described in Claim 1, comprising the following stages:

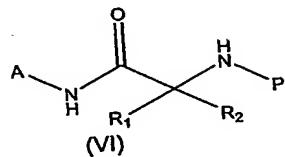
i) reaction of an aminoacid of formula (IV) or of one of its activated derivatives



(IV)
with a compound of formula (V)

5 A-NH₂

(V)
to obtain a compound of formula (VI):



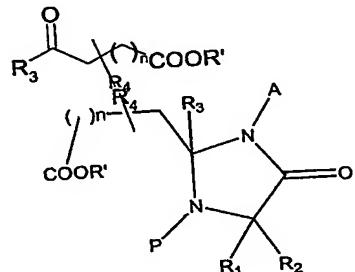
10 in which R₁, R₂ and A are as defined above in Claim 1, and P is H or a suitable

protective group;

ii) reaction of the compound of formula (VI) obtained in stage i) with a compound of formula (VII)

15

(VII)



to obtain a compound of formula (VIII)

(VIII)

in which A, R₁, R₂, R₃, R₄ and n are as defined in Claim 1, P is defined as above, and R' is an alkyl group;

- 5 iii) possible removal of the protective group P by means of hydrogenolysis of the compound of formula (VIII) obtained from stage ii), to obtain the corresponding compound (VIII), in which P is H; and
- iv) cyclization of the compound of formula (VIII), in which P is H coming from stage ii) or from stage iii), to obtain the desired compound of formula (I).
- 10 15. The process according to Claim 14, in which R' is chosen between methyl and *tert*-butyl, and P is chosen between H, benzyl and benzyloxycarbonyl.
16. The process according to Claim 14, in which, in said stage iv), the cyclization reaction is carried out by heating the compound (VIII) in the absence of solvent at 120°C and in vacuum conditions, or else by reflux-heating the
- 15 17. The process according to Claim 14, in which said stage ii) is conducted by reflux-heating the compounds of formula (VI) and (VII) in a protic solvent for a time comprised between 2 and 24 hours, possibly in the presence of a base.
18. The process according to Claim 14, in which the reaction described in stage
- 20 19. The process according to Claim 14, in which the reaction of stage i) is conducted by reacting together the compound (IV) and the compound (V) in the
- 25 20. The process according to Claims 18 or 19, in which said temperature is comprised between -10°C and 20°C.
21. A pharmaceutical composition comprising as active principle one or more compounds of formula (I) as described in Claim 1, or pharmaceutically acceptable salts or solvates thereof.
- 30 22. The pharmaceutical composition according to Claim 21, further comprising vectors, diluents and/or pharmaceutically acceptable excipients suitable for

forms of administration chosen between oral, parenteral, rectal, transdermal, and transmucosal.

23. The pharmaceutical composition according to Claims 21 and 22, in the form of solutions, suspensions, soluble powders, granules, microcapsules, capsules, 5 lozenges, tablets, coated tablets, suppositories, creams, ointments, lotions, pastes, medicated plasters, membranes or gels.
24. The use of a compound of formula (I) as described in Claim 1 or of one of its pharmaceutically acceptable salt or solvate for the preparation of a medicament having nootropic and/or neuroprotective, analgesic and/or anti-hyperalgesic, 10 and anti-emetic action.
25. The use according to Claim 24, for the treatment of learning and memory deficits, Alzheimer's disease, dementia, senile dementia, post stroke vascular type dementia, epilepsy, cerebral ischaemia, mood disorders, depression, for the treatment of conditions of chronic pain, inflammatory pain, neuropathic pain, 15 visceral pain, and for the treatment of emesis.
26. The use according to Claim 24, in which said compound of formula (I) is administered in association, concurrently or sequentially, with one or more other active principles.